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THE INSECT PEST SURVEY BULLETIN.

A monthly review of entomological conditions throughout the United States.

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BUREAU OF ENTOMOLOGY
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AND
THE STATE ENTOMOLOGICAL
AGENCIES COOPERATING.

OUTSTANDING ENTOMOLOGICAL FEATURES OF OCTOBER, 1921

The Hessian fly situation is very encouraging in the central Mississippi Valley Region. Very general adoption of recommendations as to the planting of wheat after the fly-free date is reported from Ohio, Illinois, Indiana, and northern Missouri, and the fly is quite universally reported as emerging according to schedule.

The corn earworm is probably the most serious pest of the month, its outbreaks covering the greater part of the region lying east of the Rocky Mountains. Maine and Massachusetts report the most serious outbreaks of this pest in years. In New England the corn earworm as a rule occurs only in scattering localities and is not considered a pest. The Middle Atlantic States report the pest as extremely severe on late sweet corn and all field corn. In the Mississippi Valley very unusual depredations are reported from Ohio, Illinois, Indiana, Nebraska, and Missouri.

The hearing before the Federal Horticultural Board on the European corn-borer quarantine was held on October 11. This hearing was very well attended and is quite fully reported in this number.

The chinch bug is more numerous in Ohio than it has been since the series of outbreaks in 1904, 1905, and 1906. It is also present in threatening numbers in Illinois and Missouri. If weather conditions are favorable this winter we may expect next year a serious infestation from northern Ohio, Indiana, and Illinois, southward to the Gulf and southwestward over Missouri and Kansas, to northern Texas.

Reports of an outbreak of the sorghum webworm indicate a very severe outbreak of this pest in the region covered by the southeastern corner of Kansas, the southern third of Missouri, the northwestern corner of Arkansas, and probably the northeastern part of Oklahoma. In this region kafir corn seed in many cases is reported as an entire failure. An isolated report, which probably refers to this insect, has also been received from the southwestern corner of Indiana. This pest is known to occur eastward from the region infested this year to Maryland, and southward to the Gulf.

An outbreak of the apple and thorn skeletonizer in the lower Hudson River Valley developed early in the month. The insect is defoliating hundreds of trees in the infested territory.

The paradichlorobenzene treatment for the peach borer is being very generally practised this fall. In Georgia alone about one-quarter of a million pounds of this chemical will be used.

The outbreak of the grape leafhopper, which was threatened earlier in the season in the Fresno District of California, did not materialize. However, a destructive outbreak developed later in the season in the Sonoma district.

Early this month the dictyospermum scale was found for the first time in a nursery in southern California. It has previously been reported from this state as infesting avocado in a greenhouse at Berkeley in 1916.

Late in August the cotton worm appeared in the lower Gulf States, being reported from Alabama August 26 and from Mississippi August 29. By September 10, adults had been observed in upper New York State, and by the 14th in Ohio, by the 15th in Nebraska and Michigan, and by the 27th in Massachusetts. In the cotton belt this insect defoliated the cotton in some places, but did little damage to this crop except in parts of Oklahoma. Farther northward, however, quite serious damage was done to ever-bearing strawberries and the tree fruits by the adults. The moths seemed to have followed two lines of flight northward, one upward along the Atlantic Coast to the Hudson River, thence southwestward along the Great Lakes, the other flight following up the Mississippi Valley. The data, however, are very fragmentary, and further notes on the date of appearance of this insect are solicited.

The boll weevil has appeared 40 miles north of the commercial cotton producing section in Arkansas, and is now north of the crest of the Ozarks.

The Mexican bean beetle is known to occur, in addition to the territory already reported, in the western corner of South Carolina, in Cherokee and Clay Counties, North Carolina, in the southeastern border of Kentucky, in McCreary County, and in Sonora Texas.

The greenhouse leaf-tyer has been reported as very seriously interfering with certain lines of florists work in parts of New York State.

CEREAL AND FORAGE - CROP INSECTS

WHEAT

HESSIAN FLY (Phytophaga destructor Say)

- Ohio H. A. Gossard (October 21). "Hessian fly apparently issued at about the normal date this season and most of the brood came forth as adults before the 1st of October. The highest rate of emergence at the breeding stations at Sandusky and Bryn was about the 22nd of September; but steady and heavy emergence continued until a second peak nearly equal to the first was reached on the 28th of September at Bryn and on the 29th of September at Sandusky. Considerable emergence was reported on the 1st and 2nd of October, after which there was a rapid falling off of Hessian fly activity. The peak of emergence of parasites in the cages was on the 20th and 21st of September, just one or two days earlier than the peak of fly emergence. It is thought that practically all counties observed the seeding dates sufficiently well to escape any heavy infestation. The cooperation of the farmers and heavy parasitism of the fly will doubtless prevent much of a brood next year. We expect the entire State to have but little more than a normal infestation next year, even in the districts that were most heavily infested this season."
- Indiana J. J. Davis (October 14). "The Hessian fly seems to have issued normally and we do not anticipate any trouble from this source since sowing wheat after the fly-free date was universal."
- Illinois W. P. Flint (October 15). "Probably over 95 per cent of the wheat in the State was sown after the fly-free date, this in spite of the fact that in most counties a larger acreage than usual has been seeded. From present indications the fly had all emerged before wheat sown on the fly-free dates had come up. Volunteer wheat and a few early sown fields show moderate infestation."
- Missouri L. Haseman (October 18). "During the month field observations and experimental seedings of wheat in the various Hessian fly experimental fields throughout the State have been made. Extension Entomologist Burrill has also done considerable field work with county agents and farm organizations and has kept as closely in touch with the development of the fly situation as possible. North of the Missouri River much of the wheat seeding necessarily was delayed until the determined fly free date for

that section of the State. On volunteer wheat eggs have been deposited in alarming numbers and considerable trouble will no doubt develop where fields of volunteer wheat are permitted to stand throughout the fall and winter and then give off flies in the spring. Weather conditions have delayed wheat seeding and have no doubt helped materially in the northern part of the State, with the fly problem on the coming crop. South of the Missouri River conditions have been different; the fall rains stopped in time for early seeding and unfortunately too much of the wheat in the counties south of the Missouri River went into the ground from one to three weeks too early. As a result of this early seeding a number of farmers are already reporting the serious situation, asking for help in the way of saving the crop that is now doomed. As an illustration one grower in Jackson County whose letter is just before me, dated October 18, states that his 80 acres of wheat was seeded on September 10, and that it is now heavily infested, some of the flies already approaching the flaxseed stage. This wheat of course is doomed if the fly is as abundant as he reported and it is of course too late to plow under and prepare the ground for reseeding. Through Central Missouri the fly is depositing eggs later than usual, no doubt due to the prolonged cold rainy spell which did not desist until about October 6. Generally speaking in the northern half of the State the fly situation looks more promising than earlier, while south of the river, where in spite of our protests early seeding has occurred, the situation looks much more threatening though the fly is apparently not so abundant south of the river as it appears to be on volunteer wheat north of the river."

CORN

CORN EARWORM (Chloridea obsoleta Fab.)

- Maine E. M. Patch (October 8). "In September, 1892, Maine experienced a visitation of this insect. The next time this insect appeared in such numbers as to attract attention was late in September, 1915. Then we forgot what it looked like until October 1 to October 7, 1921, when early-instar specimens began to rush in and reports of serious infestations were received from Skowhegan, Charleston, Port Clyde, and Auburn."
- Massachusetts H. T. Fernald (October 13). "A most unusual outbreak of the corn earworm occurred during the latter half of September and the first half of October. We usually have from two to three cases a year from the extreme southeastern part of the State only. This year four reports were received from September 13 to September 27. Reports then started to come in in numbers and by October 13 twenty-five additional reports had been received. Sweet corn seemed to have been most seriously infested, in some cases the infestation being as high as 95 to 100 per cent. Field corn and ensilage corn were slightly infested, and one report was received of damage to popcorn."

New York -E. P. Felt (October 27). "This insect has attracted unusual attention throughout the month. Specimens were received from many parts of the State, in some cases accompanied by records of severe damage. This appears to be one of the most serious outbreaks which has occurred in the State."

C. R. Crosby and assistants report outbreaks from nearly every county in the State. The infestation seems to be attracting more attention, however, in the central and western part of the State, though reports have come in from as far north as Jefferson and Franklin Counties, and two reports from Long Island. Golden Bantam seems to be especially favored by the earworm. Many cases of ensilage corn and a few cases of Flint and Popcorn were also reported in one case in Erie County. One acre and a half of wax beans were so badly infested as to render the crop unmarketable."

Delaware J. F. Adams (October 1). "Observations so far show that several fungous diseases are commonly associated with the feeding of the earworm. The excessive moldy condition of ears this year may be charged to the earworm. In many instances at least 10 to 15 per cent of the weight of grain of infested ears is destroyed."

C. O. Houghton (October 10). "This species has injured 100 per cent of the crop in some small garden patches of sweet corn. Larvae of all sizes are to be found at this time at Newark."

South Carolina A. F. Conradi. "Mr. J. R. Blair, county agent of York County, reports that early in September late rank cotton was attacked by this insect."

Ohio H. A. Gossard (October 21). "The corn earworm has done by far more damage in Ohio to corn this season than at any time since 1904, and probably more than has been done in any year since entomological records have been kept within the State. New farmers estimate the damage to field corn to be less than 5 or 10 per cent of the money value, while many farmers have reported from 90 to 100 per cent of the ears attacked. The canners in southeastern Ohio estimate the loss on sweet corn to have amounted to 50 per cent or more. The insect has been found attacking all kinds of corn, ripe peaches, tomatoes, and beans."

Indiana J. J. Davis (October 14). "Probably the most conspicuous outbreak of the present month is the abundance and destructiveness of the corn earworm. It is very abundant in every section of the State and the infestations average from 5 to 30 per cent and in exceptional cases even much higher. A great amount of damage is being done by the corn ear rots and apparently the majority of these rots start with the corn earworm injury. Correspondents are particularly interested regarding possible injury to animals by feeding the damaged corn. Apparently the earworm itself is not harmful to animals but it is possible that some of the rots may be harmful."

At least it is not unlikely that they might cause certain disorders. Weather conditions have been favorable for certain disorders among swine and the farmer is likely to confuse these troubles and lay the blame on the earworm. Experiments have been carried on relative to the toxicity of these rots as long ago as 1892, but no conclusive results have so far been published."

- Illinois W. P. Flint (October 15). "This insect continues to injure sweet corn. Has also been reported doing serious damage to lima beans, string beans, tomatoes, and peppers. It is also abundant in many fields of alfalfa and is causing considerable damage to this crop."
- Nebraska M. H. Swenk (October 17). "The third brood of the corn earworm did considerable damage to late planted fields and sweet corn during the period covered by this report."
- Missouri L. Haseman (October 18). "This pest continued its earlier destructive work. Late sweet corn and field corn show practically 100 per cent infestation with serious damage since the heavy rains permitted much smut and mold to develop. The corn that was down from chinch bug work also suffered from rot. The worms seemed to be so abundant that they pushed out onto the foliage of tobacco, cowpeas, soybeans, apple and nursery stock, and a number of other crops, besides riddling the seed pods of tobacco, green and ripe tomatoes, and practically all the pod-forming legumes. I believe I have never seen this insect so abundant as it has been during the past month."

ARMY WORM (Cirphis unipuncta Haw.)

- Illinois W. P. Flint (October 15). "Adults of this insect are less abundant than usual for this time of the year."

CHINCH BUG (Blissus leucopterus Say)

- South Carolina A. F. Conradi (October 1). "J. W. Sanders, county agent of Kershaw County, observed this insect to be quite generally distributed over his County, but doing very little damage this season."
- Ohio H. A. Gossard (October 21). "We have had abundant inquiries regarding chinch bugs during the month of September from practically all of western Ohio from the southern to the northern part of the State and also several inquiries from northeastern Ohio. There are apparently more chinch bugs in Ohio at the present time than have been here since the seasons of 1904 to 1906. If weather conditions are favorable to their hibernation this winter and to their development next spring, we may expect severe and widespread damage from them."
- Illinois W. P. Flint (October 15). "Rains during the early fall had some effect in decreasing the numbers of the bugs, but present indications are that there are enough of these insects in hibernation to cause serious damage next season over a large area in central and southwestern Illinois."

Missouri L. Haseman (October 18). "This pest wrought havoc on the corn crop throughout quite a bit of the more heavily infested section of the State but the fall rains again have played their part, apparently, in helping to eliminate the pest where abundant. Fall burning campaigns have been planned and will be carried out in the more threatening sections of the State but the cold prolonged fall rains have been decidedly against the pest and we are hopeful that with the carrying out of burning campaigns this fall the situation will clear materially for next year."

MAIZE BILLBUG (Sphenophorus maidis Chitt.)

South Carolina A. E. Conradi. "W. J. Sanders of Kershaw County reports under date of October 1 that this insect is quite widely distributed in his county and has done considerable damage to corn."

EUROPEAN CORN BORER (Pyrausta nubilalis Hübner.)

On October 11 the Federal Horticultural Board held a hearing in Washington for the purpose of considering changes in the present quarantine against the European corn borer; also, for the discussion of the newly infested area through Ohio and Michigan. The meeting was largely attended by delegates from the New England States, New York, Pennsylvania, Ohio, Indiana, Michigan, and several other States that are vitally interested in the control of this pest.

Dr. Marlatt, chairman of the board, called on several of the government experts who are studying the European corn borer, to define the origin, the present distribution, status, etc. Messrs. Caffrey and Worthley, who have made a study of its life history and control measures, gave interesting talks and outlined what had been done to date.

The notice of the hearing sent out by the Federal Horticultural Board proposed a change in the quarantine which would make the quarantine regional rather than simply including the infested area, as it is now operated. It was the consensus of opinion that this would work a great hardship on many of the States and in the long run would be very costly and injurious. In the case of New England, where the infestation is confined chiefly to Massachusetts and where the area infested includes only about one-third of the State, the proposed quarantine is to include all of the New England States as far west as the Connecticut River. It seems that this would open a considerable new area to the ravages of the corn borer and even when the insect finally reached the Connecticut River there would be no means of checking it. Connecticut, New Hampshire, and Maine were opposed to this plan, inasmuch as they would be obliged, if it went into effect, to establish State quarantines against the infested area. These State officials were very well pleased with the present quarantine and its work, and were strongly opposed to any change.

Dr. E. D. Bell, budget official of the Department of Agriculture, appeared at the hearing and outlined fully the financial situation and implied that it would be very difficult to obtain additional funds other than those called for in the budget to fight the European corn borer.

During the afternoon session Dr. E. P. Felt, State entomologist of New York, discussed the New York infestations, giving very interesting accounts of the conditions in his State. The representatives of the other States present were heard. It was inferred that the Federal Horticultural Board would in all probability leave the quarantines as they are at the present time with the exception of quarantining the ~~recently infested areas in~~ Ohio and Michigan.

At the conclusion of this hearing, the meeting was turned over to Commissioner Arthur W. Gilbert of Massachusetts and was attended by all who were present at the Federal Horticultural Board hearing. The following resolution was proposed and was adopted unanimously:

Resolved: That this conference, after due consideration, affirms its belief that Federal quarantine measures for preventing spread of the European corn borer should be continued substantially as in the past season, on the basis of holding the pest as closely as possible to the area actually known to be infested.

It was further resolved, the resolution being adopted unanimously, "That Congress be asked for the sum of \$275,000 for the purpose of carrying out the above program for the current fiscal year."

Moved and carried that the chairman name a committee of five, of which he shall be a member and chairman, to confer with the Secretary of Agriculture and the Department Budget Officer, and others, to represent the Conference in assisting to bring about favorable consideration of the above program. The following committee was appointed: Dr. Arthur W. Gilbert, Commissioner of Agriculture, State House, Boston, Mass.; Prof. W. C. O'Kane, Durham, N.H.; Dr. George G. Atwood, Albany, N.Y.; Prof. L. R. Taft, East Lansing, Mich.; Prof. G. I. Christie, Lafayette, Ind.

SORGHUM AND KAFIR CORN

SORGHUM WEBWORM (Celama sorghiella Riley)

Indiana J. J. Davis. (October 14). "We have received a small undetermined lepidopterous caterpillar which has been very destructive to sorghum and millet, eating into and destroying the seeds. This was reported from the extreme southern end of the State and the farmer sending in material advises us that he has had trouble for the last three or four years with this same insect."

- Arkansas Dwight Isley (October 10). "There has been considerable complaint of injury to kafir corn heads, from the western and central part of Arkansas, by the larvae of this insect. (Specimens determined by Mr. Carl Heinrich, U.S.N.M.). I have seen it in fields in the central part of the State and at Fayetteville where nearly 100 per cent of the kafir grain is destroyed."
- Missouri L. Haseman (October 18). "During the month this insect has probably created more excitement than any other and has gotten into the State press quite extensively. Preliminary investigations into the bibliography of the insect seem to reveal the fact that for the first time in its history this worm has assumed the role of a serious menace to the sorghum-like crops in Missouri. I presume it has also been injurious in the kafir-growing sections of Kansas and Oklahoma, judging by reports from our southwestern counties. It has been destructive in a number of counties principally south of the Missouri River. It has been destroying sorghum and kafir in the following counties: Newton, Jasper, Lawrence, Cedar, Polk, Greene, Webster, Dallas, Laclede, Benton, Phelps, Dent, Crawford, Butler, and Boone. Our county survey has not been completed but I dare say it has done some damage in every county south of the river where sorghum or kafir is grown to any extent. In some localities the grain of these crops has been damaged to the extent of 70 per cent of the crop. In a few individual cases the grower reports a 100 per cent loss. In other cases the damage for the entire county is estimated as low as 20 per cent. In those counties where it is no doubt present but from which we have no reports, the damage is probably negligible or has been largely overlooked by the grower. Breeding experiments are being carried on to determine its life cycle and yearly habits and a detailed report of this will be given later. Studies in connection with parasitism reveal that both eggs and the larvae are attacked by hymenopterous parasites. Two larval parasites have been reared and one species of egg parasites has emerged from eggs in confinement. While sorghum crops are not a major crop in Missouri they are coming to be important grain crops for the Ozark region of the State and if this worm continues as destructive as it has been this year it is certain to seriously handicap the growing of these crops in Missouri."
- Kansas G. A. Dean (October 11). "Several reports have reached the department of serious injury to kafir heads by the sorghum webworm. This is the first time we have received any report of this insect injuring kafir in this State. The infestation is confined to the southeastern part of the State. In some instances, fields as large as 15 acres are a total loss."

CLOVER AND ALFALFA

FALL ARMY WORM (Laphygma frugiperda S. & A.)

Ohio H. A. Gossard (October 21). "The fall army worm has been more or less conspicuous in several places and is probably general over the State."

Indiana J. J. Davis (October 14). "The fall army worm was abundant in clover and alfalfa fields in several sections of the State, and reports were received early in October from scattered sections throughout the State."

Michigan R. H. Pettit. "This insect has been much more serious than ever before in the lower half of the State, in some cases having destroyed 50 per cent of the crops attacked. It seems to be most serious on alfalfa, rye, and cowpeas. I am not sure of the species but have some which we are rearing for definite determination."

GARDEN WEBWORM (Loxostege similalis Guen.)

Indiana J. J. Davis (October 14). "The alfalfa webworm has been present in destructive abundance in northern Indiana and is attacking principally alfalfa."

Michigan R. H. Pettit. "This insect has been much more numerous than usual in the southern part of Michigan, where it was attacking alfalfa."

UNDETERMINED LEPIDOPTER/.

Indiana J. J. Davis (October 14). "An unknown caterpillar, similar to but evidently distinct from the corn earworm, is very abundant in northern Indiana, and we have received specimens from as far south as Greencastle, Ind. It attacks clover and alfalfa and has destroyed many of this season's plantings. The caterpillar is far more abundant and destructive than either the fall army worm or the alfalfa webworm. We have not yet obtained adults and are therefore not positive of the identification. Another unknown caterpillar was reported from one section in southern Indiana as destructive to alfalfa and clover. It is a spiny caterpillar, apparently a nymphalid, but we do not know the species."

SOYBEANS AND COWPEAS.

GREEN CLOVER WORM (Plathypena scabra Fab.)

South Carolina A. F. Conradi. "Mr. J. M. Eleazer reports from Saluda County that this insect is abundant in scattered localities in his county, but is not doing much damage. It is attacking velvet beans and soybeans."

COWPEA CURCULIO (Chalcodermus aeneus Boh.)

South A. F. Conradi. "County agents of Saluda and Kershaw counties re-
Carolina port this insect as doing considerable damage to cowpeas in their
territory."

SUNFLOWERS

DIPTEROUS MAGGOT.

Montana A. L. Strand (September 25). "This maggot, the identity of which
is unknown, was found infesting 80 per cent or more of the Grant
Russian sunflowers grown on the College farm. Although the infes-
tation is high, the decrease in tonnage due to the insect is small.
Most of the maggots leave the stalks through which they bore from
the head almost to the crown about September 6 to 12, or just previous
to the time of cutting, to pupate in the soil about the roots of
the plants."

T R U C K C R O P I N S E C T S

POTATO AND TOMATO

COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

Kansas F. M. Wadley (October 21). "The Colorado potato beetle has been, from my observations, less numerous than in former years."

POTATO FLEA-BEETLE (Epitrix cucumeris Harr.)

New York I. H. Vogel (October 1). "In fields not sprayed the crop was reduced about 10 per cent at Mattituck, Long Island."

TOBACCO WORM (Phlegethontius quinquemaculata Haw.)

Delaware C. O. Houghton (October 10). "Larvae of various sizes are still quite common about Newark. About the usual amount of damage has been done by this species this year."

TOMATO WORM (Phlegethontius sexta Joh.)

Ohio H. A. Gossard (October 21). "Among lepidopterous forms more abundant than usual may be named the tomato hawk moth which was received from four different localities within a five-day period in September."

CABBAGE AND TURNIP

IMPORTED CABBAGE WORM (Pontia rapae L.)

New York I. H. Vogel (October 1). "Leaves of cauliflowers were badly damaged at Mattituck, Long Island, but apparently there was not much commercial loss to the crop. Also some damage to young cabbage seed stock."

Delaware C. O. Houghton (October 12). "Larvae are numerous on late planted cabbage and adults are still on the wing."

District F. H. Chittenden, Bureau of Entomology (October 3). "The common cabbage of Colum- worm has continued somewhat later than in former years and, although it appeared at about the same time, it has done less damage than the cabbage looper."

South

Carolina A. F. Conradi. "Mr. W. R. Gray, county agent of Clarendon County, reports under date of October 1 that this insect has done very severe damage in his county."

Ohio H. A. Gossard (October 21). "The imported cabbage worm was noted in great abundance all fall around Wooster."

Montana A. L. Strand (September 25). "The imported cabbage worm has done more than the average amount of damage in Montana during the present season, even though spraying is much more widely practiced."

H. E. Morris (October 15). "The cabbage worm is unusually abundant this year. Repeated sprayings did not control this pest."

CABBAGE WEBWORM (Hellula undalis Fab.)

South
Carolina A. F. Conradi. "Mr. S. M. Byars, county agent of Anderson County, under date of September 20, reports that this insect has destroyed about 50 per cent of the rutabagas and turnips in his county. Mr. S. B. Altman, county agent of Greenwood County, under date of September 30, reports that this insect is also quite serious in his county."

FALSE TURNIP APHIS (Aphis pseudobrassicae Davis)

Louisiana T. H. Jones (October 12). "This plant-louse usually becomes injuriously abundant on turnips, mustard and radishes at this season of the year, and complaints have been received from Ringgold, White Sulphur Springs and Whitefield, referring to damage by this insect."

MOLE CRICKETS

South
Carolina A. F. Conradi. "Mr. S. B. Altman, county agent of Greenwood County, under date of September 30, reports that these insects are very injurious to gardens in his county."

Alabama K. L. Cockerham (October 12). "Damage to cabbage seed beds, beets, radishes and rutabagas is more serious than usual about Bayou La Batre. The insect damaged from 50 to 75 per cent of the crops attacked. These insects work most seriously during spells of wet weather."

CABBAGE SEED WEEVIL (Ceutorhynchus quadripes Panz.)

New York I. H. Vogel (October 1). "About 40 per cent of the seed stalks are infested in the vicinity of Mattituck, Long Island, but the loss of said crop is not much over 7 per cent. All stages of this insect were found on October 1."

CABBAGE LOOPER (Autographa brassicae Riley)

New York I. H. Vogel (October 1). "Fairly abundant and quite injurious to the leaves, but causing very little commercial damage to the crop at Mattituck, Long Island."

District
of Colum-
bia F. H. Chittenden, Bureau of Entomology (October 3). "The cabbage looper appeared in great numbers in the District of Columbia, Maryland and Virginia on late cabbage and had made considerable ravages before its

presence was detected."

Ohio H. A. Gossard (October 21). "The cabbage looper was noted in great abundance all fall around Wooster."

STRAWBERRY

STRAWBERRY ROOT-BORER (Graphops nebulosus Lec.)

Nebraska M. H. Swenk (October 17). "Some strawberry beds were injured by the larvae of this insect."

WHITE GRUBS (Phyllophaga sp.)

Nebraska M. H. Swenk (October 17). "Injury by white grubs to strawberries continued up to the latter part of September."

ASPARAGUS

COTTON CUTWORM (Prodenia ornithogalli Guen.)

Maryland F. H. Chittenden, Bureau of Entomology (October 3). "The so-called cotton cutworm appeared in great numbers on asparagus at College Park and elsewhere in Maryland than has been noticed for a long period of years. It was more abundant on well grown plants than on new growth. It was not noticed to attack any other plant in the vicinity."

BEANS

MEXICAN BEAN BEETLE (Epilachna corrupta Muls.)

South Carolina A. F. Conradi. "The Government inspection in Oconee County reports that this insect is locally distributed in this county. The damage this year, however, has been very slight."

Kentucky C. H. Popenoe, Bureau of Entomology. "Inspections by Luther Brown have determined a light and local infestation of the Mexican bean beetle to occur in McCreary County, Kentucky."

North Carolina C. H. Popenoe, Bureau of Entomology. "Inspectors of the Bureau of Entomology have found light infestations of the Mexican bean beetle in Cherokee and Clay Counties in the western portion of the State."

Texas C. H. Popenoe, Bureau of Entomology. "Dr. W. D. Hunter transmits report of the occurrence of the Mexican bean beetle at Sonora, Tex."

BEAN APHIS (Aphis rumicis L.)

Ohio H. A. Gossard (October 21). "All sorts of aphids have been quite abundant all season. During late September and October we received Aphis rumicis from Cleveland."

CUCUMBERS, MELONS AND SQUASHES.

PICKLE WORM (Diaphania nitidalis Cram.)

Missouri L. Haseman (October 18). "During the month this pest did extensive damage in this State. It has been reported by farmers and truck gardeners from various sections."

COTTON APHIS (Aphis gossypii Glov.)

Kansas F. M. Wadley (October 21). "The melon crop here was large, due to the absence of the melon aphid which is usually so injurious and there was a tendency towards a glutted market. The melon business here will always be subject to such fluctuations until the farmers are able to control in a satisfactory manner the aphids every year."

SQUASH LADYBIRD (Epilachna borealis Fab.)

Delaware C. O. Houghton (October 11). "Adults were quite common on late squash at Newark."

District of Columbia F. H. Chittenden, Bureau of Entomology (October 3). "The squash ladybird, related to the Mexican bean beetle, was more abundant in the parts of Maryland and Virginia, close to the District, than in many years previously. In fact, it is more abundant than the writer has ever noticed it before in this vicinity."

FRUIT INSECTS

APPLE

APPLE APHIS (Aphis pomi DeG.)

Washington E. J. Newcomer (September 29). "This insect is more abundant than usual in the Yakima Valley. A great deal of the fruit is smeared with honeydew from this aphid and will have to be washed or reduced in grade."

WOOLLY APPLE APHIS (Eriosoma lanigerum Hausm.)

Ohio H. A. Gossard (October 21). "The woolly apple aphid has been reported from several localities injuring apple, and I have noticed it during the past month in unusual abundance on apple trees with shaded trunks at Wooster."

CODLING MOTH (Carpocapsa pomonella L.)

Washington E. J. Newcomer (September 29). "Present indications are that the percentage of side stings and calyx worms will be lower than usual in the Yakima Valley. Sprayed trees run from less than 1 to 20 per cent, while unsprayed trees range from 35 to 100 per cent infested."

RESPLENDENT SHIELD-BEARER (Coptodisca splendidiforella Clem.)

Ohio H. A. Gossard (October 21). "This insect was received from Leipsic and one or two other localities this month."

APPLE AND THORN SKELETONIZER (Hemerophila pariana Clerck)

New York E. P. Felt. "Under date of October 5 Mr. G. M. Coddington reports that this insect has severely affected and even defoliated hundreds of trees in southern Westchester County along the Hudson River. There has been damage as far north as Ossining. The outbreak throughout the southern part of the county appears to have been generally severe, while last year there was little injury, except to Dobbs Ferry and Hasting. Under date of October 22, he reports that hundreds of trees have been entirely defoliated in the region about New Rochelle and White Plains. Back of Mamaroneck and in Tuckahoe entire orchards have been stripped. Mr. P. L. Heusted reports under date of October 22, that this insect has been noticed on the west bank of the Hudson from Nyack to Chester, a distance of about 45 miles."

M. D. Leonard (October 5). "Foliage of young trees themselves suffering from the infestation about Nyack. Leaves badly skeletonized, and freshly emerged moth observed on October 10 in Putnam County."

APPLE TRUMPET LEAF-MINER (Tischeria malifoliella Clem.)

Georgia O. I. Shapp (October 15). "This insect is doing some damage to apple foliage at Marshallville and in Crawford County."

Undetermined Leaf Skeletonizer.

- Missouri L. Haseman (October 18). "During the past month one of the small leaf-feeding caterpillars of the skeletonized type has done considerable damage, more especially to the foliage of young apple trees both in the nursery and orchard. It has attracted attention from the southern part of the State, as well as through the central and northern part of the State. The feeding came late in the season and did not result in any serious injury."

RED-HUMPED APPLE CATERPILLAR (Schizura concinna S. & A.)

- Montana L. Strand (September 10). "The red-humped apple caterpillar which occurs in Montana only in the region of Flathead Lake had left the trees and was preparing to pupate. More damage occurred this season than for several years past."

APPLE MAGGOT (Rhagoletis pomonella Walsh)

- New Hampshire S. B. Detwiler, Bureau of Plant Industry (August 30). "This insect is very bad this year about Plymouth. The damage seemed to be much worse on Jonathan apples, which in some cases are 100 per cent infested."
- New York M. D. Leonard. "Badly infested northern spies from Long Island and crab-apples from Monadnock were sent into this office during late September."

Erythronseura obliqua Say

- Ohio H. A. Gossard (October 6). "We received this insect today from Waterville with a statement that it caused great annoyance to the apple pickers from flying in their faces and that it seemed to be doing damage to apple foliage."

PEACH

PEACH BORER (Aegeria exitiosa Say)

- Ohio H. A. Gossard (October 21). "All fall we have received a stream of inquiries regarding the use of paradichlorobenzene for the peach borer, which indicates that this remedy is likely to be quite generally tested over the State."
- Georgia C. I. Snapp (October 15). "Practically all of the growers in the Georgia Peach Belt are using paradichlorobenzene this week on trees over 6 years of age for the control of the peach-tree borer. About one quarter of a million pounds of the chemical will be used by Georgia growers this year. The insect is doing much damage in neglected and not properly cared for orchards. The infestation appears to be normal, but heavier on the light soils poorly drained."

SHOT-HOLE BORER (Scolytus rugulosus Ratz.)

- Ohio H. A. Gossard (October 21). "The fruit-tree barkbeetle came to us five times from widely separated points in late September and has come to us twice in October. We have also noted it in considerable abundance on weakened peach trees at Wooster."

Georgia O. I. Snapp (October 15). "Many trees in neglected orchards are being attacked by this insect following San Jose scale infestation. The adults have been observed feeding above buds on healthy twigs. The infestation is probably heavier than normal this season."

PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Georgia O. I. Snapp (October 15). "The curculio infestation is still abnormal in the Georgia peach belt, many adults hibernating. Practically all adults have entered hibernating places by this date. Some trees yield 15 to 20 beetles when jarred during the fall."

PEACH TWIG MOTH (Anarsia lineatella Zell.)

California E. O. Essig (October 7). "This insect is much more abundant than usual throughout the entire peach district. The chief injury has been to fruit of late cling peaches which in some cases are damaged from 30 to 50 per cent."

SAN JOSE SCALE (Aspidiotus perniciosus Comst.)

Georgia O. I. Snapp (October 15). "Infestation appears to be heavier than normal in all sections of Georgia peach belt. Crawlers have been very abundant, and some of the fruit is spotted, apples being especially heavily spotted with the scale. Climatic conditions have been excellent for the development of the insect during the past summer. Many adults probably survived the winter on account of careless spraying or not giving prunings the proper attention. Furthermore, the past winter was mild. The infestation is so heavy that many growers will be compelled to make two scale applications during the dormant season. Scale spraying will start next month. Many proprietary compounds for scale are used in the Georgia peach belt."

SILVER YEF MITE (Phyllocoptes cornutus Banks)

D. D. Sharp (September 22). "Leaves badly silvered about Hemet, Riverside, and Wineville. Lime-sulphur was used with considerable success in the Hemet section."

California E. O. Essig (October 7). "This insect is more in evidence than during any past year, it being comparatively new this season, and is appearing in many sections of the State for the first time."

PLUM

RED-HUMPED APPLE CATERPILLAR (Schizura concinna S. & A.)

California O. E. Bremner (September 20). "This insect is doing considerable damage to young prune trees about Healdsburg."

PECAN

TWIG GIRDLER (Oncideres cingulata Say)

South Carolina A. F. Conradi. "S. M. Byars, county agent of Anderson County, reports that this insect is widely distributed in his county."

orida J. Charfin (October 25). "This insect is reported as doing serious damage to Australian pines on the lower east coast, where it is also attacking guava. It is also reported from all over the State as doing quite serious damage to pecans.

PECAN SHUCKWORM (Laspeyresia caryana Fitch)

orgia O. I. Snapp (October 15). "This insect is about normally abundant this season in the Fort Valley section."

COTTONY CUSHION SCALE (Icerya purchasi Mask.)

uisiana T. H. Jones (October 5). "Mr J. B. Anthony, county agent of Caddo Parish, sent specimens of the cottony cushion scale on pecan with the information that they were also present on oaks and several other kinds of trees in one neighborhood in Shreveport, the trees being practically covered with the pest. So far as I am aware this is a new locality for this species. It has not been taken north of Baton Rouge in this State before."

GRAPE

GRAPE LEAFHOPPER (Erythroneura comes Say)

ifornia O. E. Bremner (September 20). "This is the heaviest infestation observed in Sonoma for a number of years, where we estimate that 10 per cent of the crop was damaged."

A. J. Flebut (October 3). "The injury expected because of the large number of adults present in the spring did not materialize in the Fresno district, although scattered infestations show considerable loss of foliage, especially where the water conditions were not good. At present it looks as though a large number of adults would go into hibernation this fall."

GRAPE IDEALYBUG (Pseudococcus maritimus Ehrh.)

ifornia A. J. Flebut (October 3). "This insect is much less abundant than usual in the Fresno district. Twelve reports of infested fruit coming into packing houses in this county compared with 115 reports in 1920. Traces can only be found in vineyards which were heavily infested last year. All cases reported are very slight, and the experimental work of the past season rendered a failure, because checks were also free from the pest. The large reduction in numbers is due in part to parasitism by Pseudaphycus sp."

ACHEMON SPHINX (Pholus achemon Drury)

ifornia A. J. Flebut (October 3). "The outbreak which was threatened at Merced County has been entirely cleaned up by timely spraying for the first brood. No second or third brood showed up in that area which was entirely defoliated."

ALFALFA CATERPILLAR (Eurytus eurytheme Boisd.)

California A. J. Flebut (September 6). "An insect, which is tentatively determined as the above, has appeared in a vineyard near Terra Bella and one near Delano, both young vineyards on new land. The caterpillars are feeding on the foliage but so far have done no serious damage."

AVOCADO

DICTYOSPERMIUM SCALE (Chrysomphalus dictyospermi Morg.)

California E. O. Essig (October 7). "This insect first appeared on avocado in a greenhouse at Berkeley in 1916, and first appeared in a nursery in southern California at La Habra on October 2 of the present year."

S O U T H E R N F I E L D - C R O P I N S E C T S

COTTON

BOLL WEEVIL (Anthonomus grandis Boh.)

South

Carolina A. F. Conradi. "Mr. H. K. Sanders, county agent of Chester County, reports under date of September 15 that this insect is doing serious damage in his county."

Arkansas

Dwight Isley (October 10). "Cotton boll weevil has appeared in a small cotton field on the Experiment Station Farm at Fayetteville. This is of particular interest in that Fayetteville is about 40 miles north of the commercial cotton producing region and is separated from it by the crest of the Ozarks. Weevils were first collected the latter part of last month. At that time a few nearly mature weevils were found in squares, so that the migration may have occurred a few weeks earlier."

Texas

M. C. Tanquary (September 26). "Many letters continue to come in from various sections of the State indicating a very heavy and widespread outbreak of boll weevil."

COTTON WORM (Alabama argillacea Hübner.)

Massachusetts

H. T. Fernald (September 27). "A small flight of these insects appeared on this date at Amherst; no reports have been received from elsewhere in Massachusetts."

New York

W. T. M. Forbes (October 10). "A heavy flight of these moths has been reported from Sprakers in Montgomery County, the moths being so numerous as to be a nuisance at night in one house."

M. D. Leonard (October 10). "Observed a moth in a building at Ithaca today."

Ohio

H. A. Gossard (October 21). "This insect was sent to us September 26 from Ashtabula with a complaint that it was damaging peaches and that the moths were very abundant. They were quite abundant at points farther west about the middle of September."

Indiana

J. J. Davis (October 14). "The cotton caterpillar moth has been reported from all sections of the State, particularly in the northern end where it has damaged apple and ever-bearing strawberries, in each case the fruit being injured."

- Nebraska M. H. Swenk (October 17). "Shortly after the middle of September there was a conspicuous flight of the cotton worm."
- Maryland F. W. Oldenburg (September 26). "Lamp-posts and buildings in Cumberland were covered with the cotton moths on this date."
- South Carolina A. F. Conradi. "Mr. J. R. Blair, county agent of York County, reports under date of September 20, that this insect is present on all late-grown cotton, defoliating the plants, but doing no damage. Mr. J. A. Berley reports under date of October 1 that in Anderson, Oconee County, this insect is defoliating plants but doing no damage."
- Missouri L. Haseman (October 18). "This peculiar moth has again moved north over Missouri in destructive numbers, attracting attention from various parts of the State. It has been reported as being especially destructive to everbearing strawberries, to the tomato crop, late cantaloupes, and where the apple crop was not a complete failure it has also done some damage to apples. Here in Central Missouri it seems to be fully as abundant as in its last heavy migration about 10 years ago."
- Oklahoma Robert Stratton Agricultural Experiment Station (October 15). "The cotton worm has destroyed the leaves of whole fields of cotton. In some cases this occurred so early that the entire crop was nearly destroyed."
- Texas M. C. Tanquary (September 26). "There is a heavy infestation of the cotton leaf-worm in the vicinity of College Station, but the infestation developed too late in the season to do any damage."

INSECTS ATTACKING MAN AND DOMESTIC ANIMALS

BOOK LOUSE (Atropos divinatoria Mull.)

- Indiana J. J. Davis (October 14). "In some sections of the State the common book louse has been reported as very abundant in dwellings. Apparently this insect is capable of being a very serious nuisance when it once becomes established in a dwelling, but fortunately such infestations are rare, at least in Indiana."

STABLE FLY (Stomoxys calcitrans L.)

- Missouri F. C. Bishopp (September 27). "During the latter part of August and early September a very severe outbreak of the stable fly occurred over the greater part of the State. Great annoyance and suffering were experienced by live stock of all kinds and farming was handicapped."

FOREST AND FIELD TREE INSECTS

GENERAL FEEDERS

FALL WEBWORM (Hyalophora cunea Drury)

- Nebraska. M. H. Swenk (October 17). "In western Nebraska injuries by the fall webworm continued until the middle of September and a little later."

BAGWORM (Thyridopteryx ephemeraeformis Haw.)

- Delaware C. O. Houghton (October 13). "This insect has been about as destructive as usual about Newark this year."

MAPLE

GREEN-STRIPED MAPLE WORM (Anisota rubicunda Fab.)

- Delaware J. F. Adams. "This species was abundant throughout Sussex County during July on silver maples."

SILVER MAPLE LEAF-MITE (Phyllocoptes quadripes Shim.)

- New York M. D. Leonard (September 27). "Observed a young tree with numerous galls on the leaves in Syracuse."

POPLAR

OYSTER-SHELL SCALE (Lenidosaphes ulmi L.)

- New York C. R. Crosby (October 17). "Very abundant on Carolina poplars about Ithaca."

CICADA (Okanogana rimosa Say)

- Montana A. L. Strand (September 16). "The difficulty in growing shade trees (cottonwood) in the vicinity of Butte has been increased by the work of this insect, whose egg punctures kill the smaller twigs and branches."

COTTONWOOD LEAF-MINER (Zeugophora scutellaris Suff.)

- Montana A. L. Strand (September 10). "Cottonwood territories throughout that part of Montana lying east of the Continental Divide suffered severely from this insect during August and September."

TULIP

TULIP TREE SCALE (Tounevella liriodendri (Gmel.))

- New York E. P. Felt (October 27). "Mr. P. L. Heusted reports that the tulip scale has been exceptionally abundant in Rockland County this year."

WILLOW

BUCK MOTH (Hemilaica maia Drury)

New York W. T. M. Forbes. "Early this season larvae were reported as stripping everything in Selkirk Bog, especially willows."

WILLOW GROVE PLANT-LOUSE (Melanoxantherium smithiae Monell)

New York C. R. Crosby (September 6). "Trees very badly infested at Pen Yan."

HICKORY

TWIG-GIRDLER (Orcideres cingulata Say)

Indiana J. J. Davis (October 14). "The hickory twig-girdler has been reported as a pest of persimmons from Mitchell."

Missouri L. Haseman (October 18). "This insect has shown up especially on elms and hickories in most unusual numbers during the past 10 days. It was reported from all parts of the State and is present in about the same destructive numbers as when it last appeared as an epidemic about 10 years ago. Elm shade trees and hickory nut trees in the open country have piles of girdled twigs under them."

BLACK WALNUT

POWDER-POST BEETLE (Lyctus parallelipipedus Melsh.)

New York E. P. Felt (October 27). "This insect has been reported as rather seriously injurious to black walnut lumber at Buffalo."

OAK

OAK LECANIUM (Lecanium quercifex Fitch)

South Carolina A. F. Conradi (September 30). "Mr. L. B. Altman, county agent of Greenwood County, reports that this insect is causing the death of branches in water oak trees in his county."

LARCH

LARCH CASE-BEARER (Coleophora laricella Hübner)

Delaware C. O. Houghton (October 1). "Two trees on the University Campus at Newark have been heavily infested with this species this year."

CAMPBOR

CAMPBOR SCALE (Pseudaonidia duplex Ckll.)

Louisiana

T. H. Jones (September 23). "On this date I was called to Victory Park, Baton Rouge, to look at scale insects on Camellia japonica. Examination of the scale indicated that it was the camphor scale. Specimens were sent to Mr. Harold Morrison and he has verified the determination. It seems that the plants on which the scale was found were set out in the Park about a year ago and came from New Orleans. This is, I believe, the first finding of the scale in Louisiana outside of New Orleans."

GREENHOUSE AND ORNAMENTAL PLANTS

MISCELLANEOUS FEEDERS

FALL ARMY WORM (Lythygma frugiperda S. & A.)

Ohio H. A. Gossard (October 21). "The fall army worm has been more or less conspicuous in several places and is probably general over the State. It was found destroying lettuce in a greenhouse at Lancaster and has been injuring geraniums in the State greenhouse at Wooster."

CORN EARWORM (Chloridea obsoleta Fab.)

Delaware C. O. Houghton. "Dr. J. F. Adams reports that this insect was damaging zinnias and chrysanthemums at Wyoming, Del., the 1st of September."

CITROPHILUS MEALYBUG (Pseudococcus gahani Green)

California E. O. Essig (October 7). "This insect bids fair to be the most serious mealybug in the central and northern coast districts. It attacks orchard trees, ornamental shade trees, and many annuals, and is becoming more and more abundant each year in the San Francisco Bay Region."

CHRYSANTHEMUM

CHRYSANTHEMUM GALL MIDGE (Diarthronomyia hypogaea F. Loew)

New York E. P. Felt (October 27). "This insect has become established in an Oneonta greenhouse and a few weeks ago was received from Lockport. Both of these are evidently recent infestations and indicate the dissemination of the pest by the shipment of infested plants or cuttings."

GREENHOUSE LEAF-TYER (Phlyctaenia ferrugalis Hübner)

New York M. D. Leonard (October 1). "A bad infestation in a greenhouse at Auburn has been reported. Chrysanthemums, especially the early ones, are nearly ruined. Geraniums are also badly infested. The grower stated that he has to give up growing cinerarias entirely on account of this pest, and thinks he may have to give up growing chrysanthemums, unless he can find a practical means of control. He reports this insect equally as destructive on plants grown out of doors."

PRIVET

WEST INDIAN PEACH SCALE (Aulacaspis pentagona Targ.)

Louisiana T. H. Jones. "For some time I have been hearing reports concerning injury to privet hedges in New Orleans, apparently due to a scale insect, but have not seen specimens. Specimens of this scale have been taken in New Orleans and Hammond, sections of the privet hedges from which they were taken being dead, apparently due to the scale, and previous statements regarding injury to such hedges seem to refer to this insect."

ASTER

Forda olivacea Rohwer

New York C. R. Crosby (September 8). "Aphids, which were tentatively determined as the above by Dr. A. C. Baker, were found seriously infesting the roots of asters at Ithaca."

ROSE

POTATO APHIS (Macrosiphum solanifolii Ashm.)

Delaware C. O. Houghton (October 5). "This species is still quite common on the tips of rosebushes at Newark. Have observed no injury to potatoes this season."

C O R R E C T I O N

J.L. Webb. In the last issue of this bulletin, Vol. 1, No. 6, reference was made on pp. 228 and 252 to the discovery of the boll weevil on the island of San Salvador. In making this report the island of San Salvador was confused with the city of San Salvador in the state of Salvador in Central America. The specimens mentioned came from the latter country.

THE HISTORY OF THE

REIGN OF KING CHARLES THE FIRST

BY JOHN BURNET

IN TWO VOLUMES

LONDON

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